Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
Sennheiser Electronic Corporation, Request	)	RM-11821
for Amendment of Part 74 of the Commission's	)	
Rules to Advance the Use of Spectrum Efficient	)	
Wireless Microphone Equipment	)	

REPLY COMMENTS OF AEROSPACE AND FLIGHT TEST RADIO COORDINATING COUNCIL, INC.

Aerospace and Flight Test Radio Coordinating Council, Inc. ("AFTRCC"), by its counsel, hereby submits Reply Comments in response to the Petition for Rulemaking ("*Petition*") filed by Sennheiser Electronic Corporation ("Sennheiser") in the above-captioned proceeding and the comments of other parties in response thereto.[1] While, for the reason stated, as explained further below, AFTRCC does not have any specific present concerns about the operation of Wireless Multi-Channel Audio System ("WMAS") technology in the 1.4 GHz aeronautical mobile telemetry ("AMT") Band (1435-1525 MHz), as Sennheiser proposes in the *Petition*, AFTRCC will continue to monitor the proceeding. AFTRCC may file more substantive comments later should additional details emerge that could potentially undermine the careful protections of AMT adopted by the Commission in its orders in Docket 14-166, namely advance

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[1] *See Sennheiser Electronic Corp., Request for Amendment of Part 74 of the Commission's Rules to Advance the Use of Spectrum Efficient Wireless Microphone Equipment*, RM-11821, Petition for Rulemaking (filed Aug. 17, 2018) ("*Petition*"). The original filing deadline of January 14, 2019, was extended to February 8, 2019, due to the recent temporary government shutdown, making this submission timely. *See Revisions to Filing and Other Deadlines Following Resumption of Normal Commission Operations*, Public Notice, DA 19-26, 2 (Jan. 29, 2019).

coordination of wireless microphones and software-based controls that ensure wireless microphones operate only in the time and place and on the frequencies coordinated.[2]

AFTRCC is an association of the nation's principal aerospace manufacturers.[3] AFTRCC was founded in 1954 to serve as an advocate for the aerospace industry on matters affecting spectrum policy, and it serves as the recognized non-Federal Government coordinator for the shared, Government/Non-Government spectrum allocated for flight testing, including the 1.4 GHz Band. AFTRCC works closely with Government Area Frequency Coordinators, who are responsible for Federal Government use of the spectrum, in an effort to ensure that interference-free flight test operations are protected and flight safety is maximized. The Commission's rules in the 1.4 GHz Band, adopted in 2015 and modified in 2017, require secondary wireless microphone users to coordinate with AFTRCC in advance to ensure protection of primary, safety-of-life AMT operations in the Band.[4] Wireless microphone equipment used in the Band must also incorporate software-based controls to ensure that it can operate only when and where, and on those frequencies, coordinated.

In the *Petition*, Sennheiser essentially seeks rule changes that permit, but do not require, wireless microphone equipment designed to operate in the 1.4 GHz Band to utilize a wider channel, up to six megahertz.[5] In its review of the *Petition*, AFTRCC understands that the

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2 *See Promoting Spectrum Access for Wireless Microphone Operations,* GN Docket No. 14-166, *Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions*, GN Docket No. 12-268, Report and Order, 30 FCC Rcd 8739 (2015) ("Order"), *recon.*, *Promoting Spectrum Access for Wireless Microphone Operations*, *et al.*, GN Docket No. 14-166, *et al.*, Order on Reconsideration and Further Notice of Proposed Rulemaking, 32 FCC Rcd 6077 (2017).

3 *See* Attachment A, AFTRCC Membership List.

4 *See* 47 C.F.R. § 74.803(d)(2).

5 *See Petition* at Attachment, Proposed Rule Language.

maximum power over the wider channels under the proposed WMAS rules would be no more than currently allowed for 200 megahertz channel systems under the rules adopted in 2015 and modified in 2017, leading to a lower power spectral density for WMAS systems than is permitted under the existing rules for non-WMAS systems. Importantly, the *Petition* does not seek modification to the existing 1.4 GHz Band requirements of prior coordination with AFTRCC and software-based controls which ensure that the wireless microphone equipment will operate only at the time and place and on the frequencies coordinated. As long as these coordination and authentication requirements are not modified by the introduction of WMAS, AFTRCC has no objection to the *Petition*.

Whether a proposed wireless microphone operation can be coordinated with AFTRCC may well depend on the technology and operation parameters, naturally. Any applicant for FCC certification for wireless microphone equipment to operate in the L-Band, whether it uses WMAS or another permitted technology, must demonstrate in its certification request that the equipment has a built-in capability that cannot be defeated by the user to meet the applicable rules governing authentication and geolocation verification requirements following AFTRCC coordination at a particular time and place for specific frequencies before operation commences and re-verification, depending on the duration of the operation, at regular intervals.

Shure Incorporated ("Shure") notes in its comments on the *Petition* that the Commission should ensure "harmonious coexistence of WMAS technology with existing services."[6] AFTRCC concurs, and in the case of the 1.4 GHz Band, and compatibility with AMT,

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6 Comments of Shure Incorporated, RM-11821, at 4 (filed Dec. 28, 2018) ("Shure Comments").

harmonious coexistence will be enabled, first and foremost, through prior AFTRCC coordination and software-based authentication prior to and, as needed, during operation.

AFTRCC also notes that Shure suggests that the Commission should consider calculating power maximums for WMAS expressed on a power spectral density basis "to permit power levels to scale appropriately."[7] AFTRCC will monitor any developments in this regard, as well as what other technical parameters are considered, but notes, as a threshold matter, that the power or power spectral density used by wireless microphone equipment may impact whether it can be coordinated at given time and place.[8]

Finally, Shure also queries whether, at least initially, the 1.4 GHz Band should be off limits, noting that "it may not make sense to permit these operations on the 1435-1525 MHz band as an initial matter, given that equipment authentication and software-based controls necessary for coordination with [AFTRCC] . . . are still under development."[9] AFTRCC appreciates the efforts that Shure has made and continues to make, in conjunction with

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7 *See id.* at 5.

8 Similarly, AFTRCC takes no position on Alteros's suggestions that "any new rule change [should] require a minimum of 24 channels of high-quality simultaneous operation of wireless microphones in a given channel" to establish an appropriate efficiency threshold, but urges the FCC to "require a method that allows synchronization and coordination of the 6 MHz operating bandwidth equipment across multiple manufacturers' system within the single frequency band." Comments of Alteros, Inc., RM-11821, at 3, 5 (filed Dec. 28, 2018) (emphasis omitted). If such requirements are adopted, they would not upset the need to obtain prior coordination with AFTRCC or the need for software-based controls that ensure operation only as coordinated. To the extent Alteros's suggestion, or some variation is adopted, such that it might adversely affect the ability of WMAS wireless microphone systems to be coordinated with flight test operations relative to operations that adhere to the current rules, AFTRCC would simply take into account whether a proposed wireless microphone operation will use equipment under the current rules or any prospective rules when making a determination on whether a requested coordination is successful.

9 *See* Shure Comments at 5.

Sennheiser and others, to engage with AFTRCC and develop a framework for successful coordination.[10] If WMAS is permitted, AFTRCC believes that the coordination request interface and authentication controls being developed with and by Shure and others will continue to be effective provided that a request for coordination is accompanied by the full range of technical and operational parameters of the proposed wireless microphone operation utilizing WMAS to allow AFTRCC to coordinate the request. Accordingly, AFTRCC takes no positon on Shure's apparent concern about allowing WMAS operation in the 1.4 GHz Band at this time.

CONCLUSION

For the foregoing reasons, and on the conditions stated above, AFTRCC offers no present objections to the *Petition* or the initiation of a rulemaking to consider WMAS operation in the 1.4 GHz Band. AFTRCC will continue to monitor the course of Sennheiser's proposal and offer further comment as appropriate.

Respectfully submitted,

AEROSPACE AND FLIGHT TEST RADIO COORDINATING COUNCIL, INC.

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10 *See* Letter of Edward A, Yorkgitis, Jr., Counsel to AFTRCC, and Catherine Wang, Counsel to Shure, to Marlene H. Dortch, Secretary, FCC, GN Dockets Nos. 12-268, 14-166 (filed Jan. 19, 2018).

Attachment A

AFTRCC Membership List

AFTRCC Membership

AEROTEC

BOEING

BOMBARDIER

L3 MISSION INTEGRATION

Beechcraft | Cessna | Hawker

TEXTRON AVIATION

Gulfstream
A GENERAL DYNAMICS COMPANY

THE VALUE OF PERFORMANCE.
NORTHROP GRUMMAN
Aerospace Systems

Bell Helicopter TEXTRON

LOCKHEED MARTIN
Aeronautics Company

LOCKHEED MARTIN
Enterprise Operations/Government Affairs

NORTHROP GRUMMAN
Electronic Systems

Rockwell Collins

Raytheon

SIKORSKY
A LOCKHEED MARTIN COMPANY

L3 communications
Communication Systems-West

KEYSIGHT TECHNOLOGIES

Quasonix

ZODIAC DATA SYSTEMS
ZODIAC AEROSPACE